

**HEALTH CARE, FEEDING AND  
ADAPTATION IN TWO BLACK  
RHINOCEROS (*Diceros bicornis*)  
IMPORTED FROM JAPAN TO THE  
NATIONAL ZOOLOGICAL GARDENS  
IN  
SRI LANKA**

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# Conservation status

- Native to the eastern and central areas of Africa including Kenya, Tanzania, Cameroon, South Africa, Namibia, Zimbabwe
- According to IUCN Black Rhinos are Critically endangered



- Normal parameters of Black Rhinoceros as follows

- Size

  - shoulder height 143-160cm


  - adult weight 800-1400kg

- Feeding

  - Herbivorous browser eat leafy plants, branches, shoots, thorny fruits(It has been known to eat up to 220 different spp of plants)

- Habitat

  - Primarily grassland ,Savannahs tropical bush land habitats

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- Eye sight- Very poor eye sight.
  - Communication-Many forms. Sent making urine spraying on bushes, different types of complex vocalization & body languages .
  - Reproduction-Gestation period is 15-16 months  
single  
calf weight 35 – 50 kg at birth.
  - Sexual maturity- Reached 5 years old for female 7years for male.
  - Population- Total African population 3610

- Animal exchange programme with 2007 we exported two Asian Elephants Kosala and Anula to Japan.





◎ Pair of black rhinoceros imported to Sri Lanka from Japan

5 years old male(1000kg)  
from Kansawa zoological  
Gardens.

8 years old female(1200kg)  
from Hiroshima city  
zoological park.

Two Rhinos came from two  
different places and they  
adapted to Climate,  
Enviornment,Feeding  
systems in Japan in  
different conditions than Sri  
Lanka.



# MAJOR TASKS WHICH WE ACHIEVED

- Sri Lanka is a tropical country and has no seasonal variation; average temperature 25-30 Celsius, Japan is a seasonal variation country. Adaptation of Rhinos to tropical climatic conditions and different environments and new enclosures and facilities within short duration and minimum stress.
- This captive bred Rhino adapted to feeding materials in Japan, mainly Oak (*Quercus spp*) those not available in Sri Lanka. Adaptation process to different kinds of feeding materials.

- Health care management to two animals with face severe stress condition. Treatment for health issues.
- Adaptation of two Rhino with each other and process to familiarize among them.





# Pre arrangement of enclosure and environment

Before arrive two rhinos to Sri Lanka constructed suitable enclosure with some barriers, strong wall, Separate to 2 area by strong iron fence, Prepare two river sand ponds.

Ectoparasitic chemicals spray all enclosure

Facilities develop for on site quarantine.

# Methods Use for minimizing stress factor .

Two rhinos kept in two iron crates and air transported to Sri Lanka. They keep in crates 3 days.

According to long journey and complete different climate and environment animals were sevir stress and aggressiveness.



- ① Two animals were injured on head and body due to attack to crate.
- ① Transport from Air port to Colombo Zoo in early morning, it take 2 hours and routinely sprayed water on body.



Before unloading to enclosure  
Injected to both animals

Butaphospan & cynocobalamin 30 ml  
(1000 mcg/ml)

flunexin meglumine 20 ml (50 mg/ml)

wounds sprayed with providone iodine  
and margosa oil

Tranquilizers were kept ready with  
remote injection darts and gun for  
emergency

visitors and other disturbances were  
restricted.





drinking water provided with added glucose, vitamin B and ascorbic acid to drinkers.

After unloading safely, spray water on to Rhinos body in every  $\frac{1}{2}$  hour intervals.

Introduce varieties of foods to them for eating.



# Adaptation for new feed varieties and adaptation of new environment and new enclosure.

Feed formulation which use in Japan.

## Feed formulations which use in Japan

Food	Daily for male	Daily for female	Availability in Sri Lanka
GreenLeaves(Oak)	5kgs	10kgs	No
Green Grasses		15kgs	Yes
Lucerne	1kg	3kg	No
Timothy	4.5kgs		No
Hay cubes	7kgs	7kgs	No
Rice straw	2kgs		Yes
Pellet C-12	4.5kgs		Yes
Pellet for racing Horse	400gms		Yes
Sweet potato	2kgs		Yes
Apple	2kgs	2kgs	Yes
Carrot	2kgs	2kgs	Yes
Calcium,Minerals	100gms	100gms	Yes
Salt	50gms	50gms	Yes

According feeding chart send from Japan the main feed for Rhino were Oak Leaves and Hay Oak leaves not available in Sri Lanka.  
Varies following spp of leaves provided to Rhino



## Green leaf varieties which we tested for rinos

- Heen nuga (*Ficus bengamina*)
- Jack leaves (*Artocarpus heteropilus*)
- Coconut leaves (*Cocos nucifera*)
- Tamarindus leaves (*Tamarindus indica*)
- Mukunuwenna (*Alternanthera sessilis*)
- Bo leaves (*Ficus religiosa*)
- Koboleela (*Bachinia purpurea*)
- Goraka leaves (*Garcinia cambogia*)
- Manga (*Mangifera indica*)
- Co-3 Pasture
- *Bracharia brisantha* pasture
- Kikue pasture
- Gunie grass (*Megathyrsus maximus*)
- Lettuce leaves



Pumpkin, Carrot, Water Mellon,  
Mango, Grapes, Banana, Papaya,  
Cucumber,

Sweet potatoes, Potatoes

Bread

Rise straw with molasses

Fresh grass with molasses

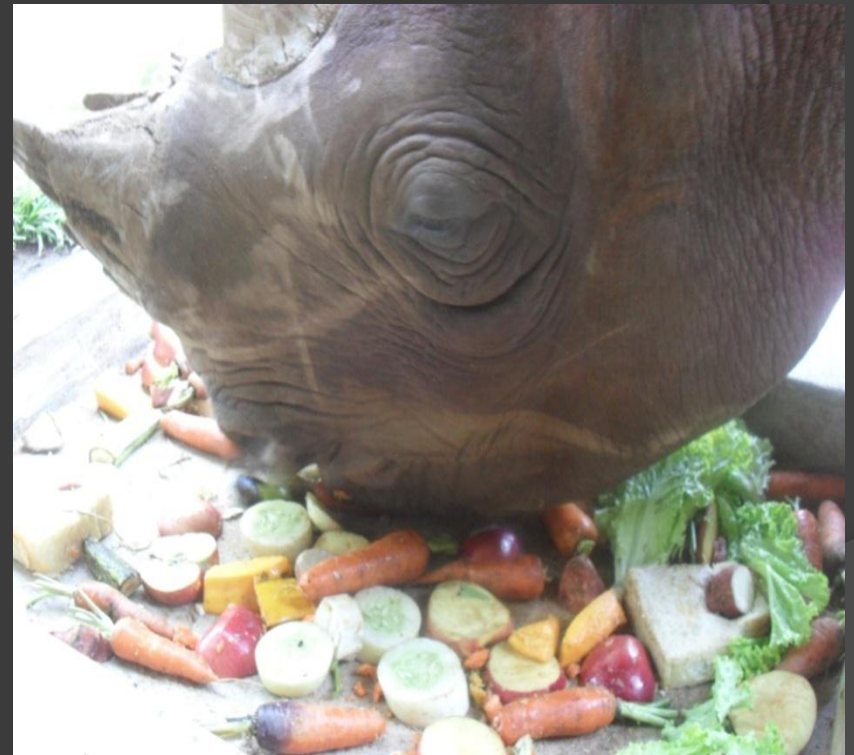
Hay with molasses

Green grams

Initially they were not eating but show some  
interested  
about those by sniffing and little taste .

Second day-female started eating ficus  
leaves , apples.

Generally both adapted to  
ficus leaves, artocarpus, coconut and  
lettuce



A collage of various feed ingredients including carrots, sweet potatoes, bread, and green grasses. The background is a dark, semi-transparent overlay on a light-colored background.

Initially they interesting all methods of molasses adding. after refused.

Prior to giving Carrot, Sweet Potatoes, Apple prepair as countable parts and count and next morning count remaining quantity.It gave idea about there preference.

Out of Varieties of green grasses (CO-3, kikiue, branches, guine grass) They mostly like CO-3, Braches was second selection.

Little interesting for cattle feed.

After adaptation of new feed we formulated fallowing feed composition.



# Feeding materials of each Rhinos per day.



Food		Morning	Evening
Anamalu-Banana		200g	200g
Apple	1kg	1kg	
Papaw		250g	250g
King Coconut		2nuts	-
Carrot		2kg	2kg
Lettuce		1kg	1kg
Sweet Potatos		1kg	1kg
Cucumber		500g	500g
Bread	2.5loaf	2.5loaf	
Barly	125g		
Salt	25g	25g	
Jack Leaves			25kg
Mixed Leaves		-	10kg
Herbivorapellat	3.5kg		
Horse pellate	2kg		

# Veterinary care and health management of new Rhino

Immediate after departure checked both animals in distance .  
wounds and traumatic injuries observed .

Initial treatments for wounds and treatment for reduce stress and pain.

Long acting Penicillin 50ml (procaine penicillin 150mg, benzathene penicillin 150mg,  
procaine hydrochloride 20mg/ml ( 3 days apart up to 15 days.)

Tetanus toxoid : 5 ampules IM

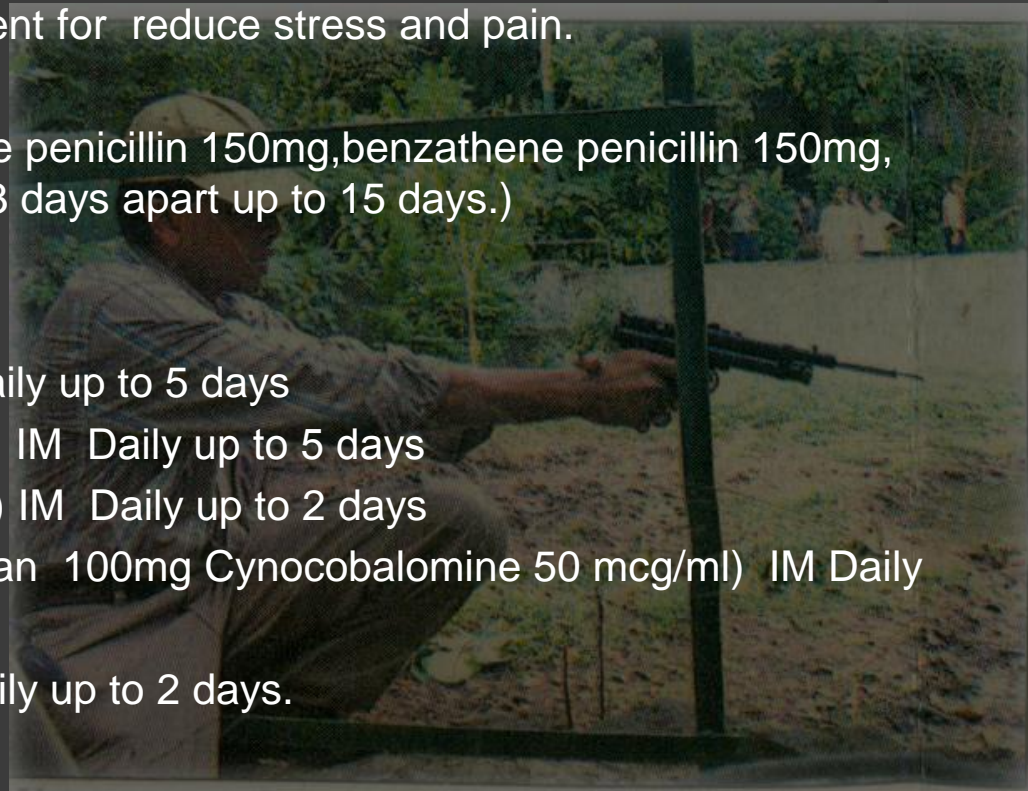
Vitamin B complex 20ml IM Daily up to 5 days

Multi Vitamin("Stress vitam") 20ml IM Daily up to 5 days

Flunexin meglumine 20ml (50mg/ml) IM Daily up to 2 days

Cynocobalomine 30ml (Butophosphan 100mg Cynocobalomine 50 mcg/ml) IM Daily  
Up to 5 days.

Dexamethasone 20ml(4.4mg/ml) daily up to 2 days.



All the injection given remotely with co2 pistol in the side of the neck below the nuchal  
hump.

Spray providone iodine mixture of margossa oil and Negasant® powder.



Initially water intake of bath animals very low  
urine whitish and concentrated due to  
dehydration .

Only way oral rehydration for promoting water  
intake vitamin B  
solution(Becadex),Ascorbic acid and  
Glucose added to water tub. Mean while  
bath by spraying water on body, small  
water quantity was swallowed by animals.



Specially male animal show some sickness. only distance diagnosis possible.

Clinical signs-

Anaroxia.

Lethargic

Dehydration-Whitish urination,occationaly

Slight diarrhea

Facial analysis revealed high count of *Balantidium*  
(It was highly increase due to stress condition )



## Treatments to male animal

Sulfer trimethoprim 60ml(Sulfadimidine 200 mg  
Trimethoprim 40mg/ml ) daily for 5 days

Dexamethasone 20ml (4.4mg/ml ) daily for 5 days

Butophospan and Cyanocobalamin) (“Catasal”) 50ml  
(Butophospan 100mg and Cyanocobalamin  
50mlcg/ml) for 5 days.

Analgin 50 ml (0.5mg/ml) up to 5 days.



Urine sample collected using a bucket and a pole. Urine strip analysis confirmed female had Ketosis .

Female was treated by

Dexamethasone 20ml for 2 days

Cyanocobalamin and

Butophospan"Catasa" 50ml daily for 5 days

Nandrolondecanoate

("Decadeurobolin") 50% (50mg/ml)  
20 vials intramuscularly at 3<sup>rd</sup> day

Long acting Penciline to female every 3 days a part

Analgin 50 ml (0.5mg/ml) daily 2 days

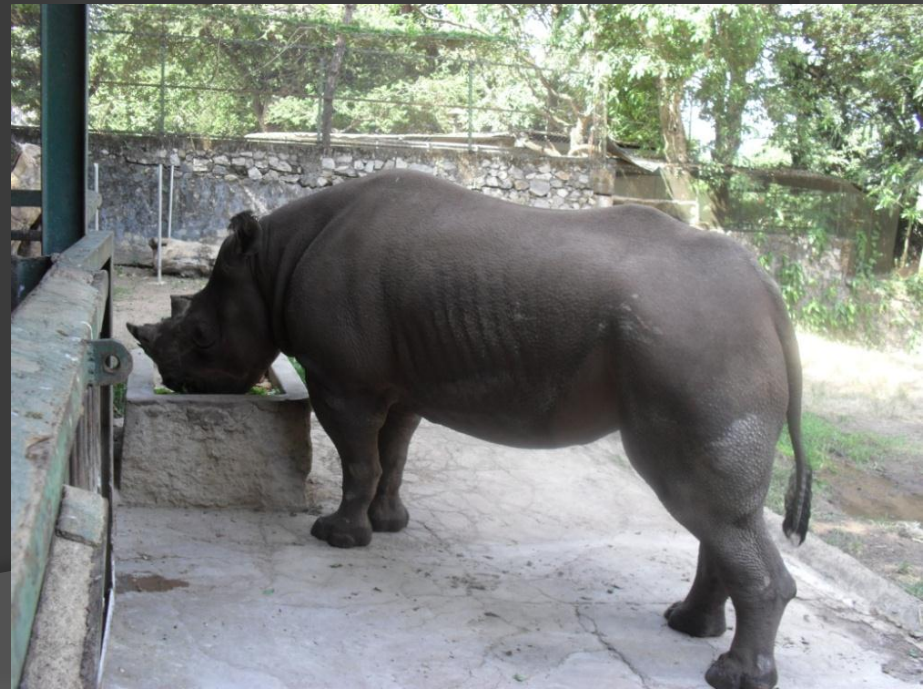




Male started eating from 3<sup>rd</sup> Day of treatments

Fecal sample negative of *Balantidium* and foam to solid,

After recovery of *Balantidium* antibiotics change to long acting penicillin 50ml every 3 days apart



Daily gave following vitamins and minerals to each animals

Vitamin B complex 15 tabs

Ascorbic acid/Vit C 100mg 10 tabs

Vitamin E 4 caps

Folic acid 5 tabs

Vitamin A and D 3 caps

Ca and P mineral mixture

Calcium lactate 8 tabs

Up to now nutrition Ca , P and other minerals given daily.

Dewarming very 3 months a part.

Albendazole or Ivermectine oral Paste

Immunized annually Anti rabies vaccine single dose Tetanus toxoid 5 ampules

After 4 months both animals infected *Coccidiosis*.  
Clinical signs- Anorexia, Lethargic, Semi solid  
faeces

Fecal analysis confirm high count of *Coccidiosis*.

## Treatments

Each animal treated by Sulfer trimethoprim  
(480mg tablets ) 15 tab twice daily for 4 days.

# Conclusion

The procedures and strategies and experiments were successful in making the pair of Black Rhinos fully adapted to Sri Lanka condition with in six months.





# Present situation of Rhinos in Sri Lanka zoo

Now almost four years completed. They were in good Health condition

Fully adapted to condition.

Rhinos names “Kosale” and “Anula” familiar to keepers and handlers.

New modification going on for expand the enclosure and increase space and give much more welfare and facilities to them. (from 500sqm to 1000sqm)

They were mate still not confirm













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